Fact Sheet

Swine Health

AFS-3-8-6

United States Department of Agriculture

Office of Governmental and Public Affairs

Internal Parasites of Swine: Natural History and Control

Authors
Arlie Todd, University of Wisconsin
Robert Behlow, North Carolina State University
Ed Batte, North Carolina State University

Reviewers
Ralph F. Hall, University of Tennessee
Gerald M. Sandidge, Marshall, Missouri

It is well known and accepted that swine are damaged by many kinds of internal parasites (worms). Considerable financial loss results from retarded growth and the failure to convert feed efficiently, from increased susceptibility to other diseases and from organ and carcass condemnations.

These parasites or worms are the same all over the United States. There is no climatic barrier to parasitism. The most prevalent worm is the "large round worm," *Ascaris suum;* the next most prevalent is the nodular worm. These are followed by whipworms and stomach worms. Two types of lungworms are found throughout the U.S. Threadworms (Strongyloides) probably parasitize every pig. In some parts of the South the large kidney worm is prevalent. All of these worms are roundworms.

In the last 20 years worms that use beetles as intermediate hosts—certain stomach worms (roundworms) and the thornyheaded worm—have declined in the Midwest.

Natural History and Chronology

The swine breeding herd has its own population of internal worms, and these survive for months and years in the external environment, on the pastures and in lots, in the farrowing houses and gestation facilities. Older animals do not become immune to worm infection; rather, they redevelop parasitisms semiannually as they go back and forth from the farrowing house to their pastures and lots. Although sows and gilts have larger populations of nodular and stomach worms, it is a mistake to believe that they do not have large roundworms *(Ascaris suum)* and whipworms. Older animals (sows) have more kidney worms than gilts.

There is little evidence of prenatal worm infection in pigs. There is transcolostral transmission (in first milk) of the tiny little threadworm, Strongyloides. A pig's first exposure to worms is to the infective larvae of Strongyloides in colostrum. This has been reported widely in the southeastern U.S. Second possible exposure to worms occurs when pigs eat Ascaris (the large roundworm) eggs, and/or stomach and nodular worm larvae in old manure from sows, found in and around the farrowing crates and pens where pigs spend the first three or four weeks of their lives. Newly weaned pigs eat more infective Ascaris and whipworm eggs in the manure which may be present in the nursery or growing-finishing lots or pens.

There is a universal prevalence of worms in 20-30 lb. pigs. Usually the first Ascaris (large roundworm) infection in pigs is the largest one. This is followed by the major whipworm parasitisms. In some sections of the U.S., whipworms cause mortalities in pigs weighing less than 20 lb. When pigs reach 70-90 lb. there is a rise in the numbers of nodular worms and stomach worms.

Many pigs now are grown to 35-40 lb. with only a few Ascaris (large roundworms) or no worms at all, but when they are put into growing pens or dirt lots they encounter overwhelming exposures. The large roundworm (Ascaris) population increases along with that of the whipworm, the nodular worm, and the stomach worms. Weaned pigs placed on dirt lots for finishing rapidly acquire considerable populations of five or six different kinds of worms. Permanent pasture lots are where lungworms persist in their intermediate hosts, earthworms. Pigs have almost no ability to resist worm parasitisms until they are well past 100 lb.

Infective stages of worms are resistant to all kinds of weather conditions and external environments—where they are eaten by pigs. There are enormous populations of infective Ascaris (large roundworm) and whipworm eggs, and infective larvae of nodular and stomach worm larvae, on swine lots and pastures. Few swine herds are free of parasitisms.

Rationale for Treatment and Eventual Control

There is a widespread and unfortunate misimpression that worm parasitisms are similar to infectious diseases. Historically, much effort has been directed toward enabling

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics (Acts of Congress of May 8 and June 30, 1914), in cooperation with the U.S. Department of Agriculture, Office of Governmental and Public Affairs, Washington, D.C. 20250, and Department of Animal Sciences, Purdue University, West Lafayette, Indiana 47907. This publication was prepared by Purdue University. It is the policy of the U.S. Department of Agriculture that all persons shall have equal opportunity and access to its programs and facilities without regard to race, religion, color, sex or national origin.

individual animals to survive parasitisms and achieve the "immune states." Swine do not achieve an immune state and become free of parasites.

Consider worms similar to the weeds which grow each year and affect plant production. Both weeds and worms have incredible ability to survive in the external environment. Both weeds and worms have annual populations, and the sows and gilts undergo parasitism as regularly as they undergo gestation. When pigs are weaned and dewormed, sows and gilts are turned out on the lots where infective stages of worms can be found year in and year out; they are reinfected. These new worms develop and flourish until sows go back into the farrowing facility where they generally are dewormed again. Deworming obviously is not complete because so much transmission of worms to young pigs occurs in the farrowing house. Failure to deworm sows and gilts completely is due to incorrect worming procedures; broad-spectrum dewormers ought to be used as the basis of treatment programs.

Sanitary procedures aid in the control of worms by removing the infective stages from the environment, but no sanitary measures are successful for more than a short time. Infective parasite eggs cling to dirty sows; so washing sows thoroughly prior to farrowing is a good practice. However, more worms are acquired by young pigs from eggs passed in manure by sows after they farrow.

Good feeding programs do not make swine resistant to worms. Better-fed animals are more desirable hosts for worms to grow up in, and the reproductive potential of worms is enhanced by the balanced rations which have more protein factors needed by worms in order to produce their eggs. However, poorly fed pigs are also very susceptible to large worm infections because they are forced to compete so completely for anything resembling food.

Deworming with Chemicals

No one should retain the notion that swine should be treated as single animals. That approach has not reduced worm populations in the past. Treat herds. Treat boars, sows and gilts to improve performance and prevent transmission to pigs. Use treatments to attack the worm populations as they develop chronologically.

Use broad-spectrum dewormers instead of products that remove only one species such as Ascaris, the large roundworm, because parasitisms are comprised of a number of kinds of worms. Deworm animals on a *regular schedule* designed to eliminate the major parasite populations. Establish a deworming schedule and follow it.

Systematic treatments related to the chronology of parasitisms are shown in the table.

Life Cycle Deworming Program

Deworm boars, sows and gilts prior to breeding and prior to farrowing to prevent exposure of the young pigs. Use 1-day treatments or new continuous deworming programs for sows and gilts before they farrow, to keep sows and gilts in the farrowing house free of parasites and unable to transmit parasitisms.

To produce worm-free feeder pigs, feed an anthelmintic-antibiotic from 20 to 40 lb. or use two, separate, 1-day treatments at 25 and 35 lb. Deworm feeder pigs soon after arrival at the farm and again at 75 and 110 lb. weight, in single day dewormings. An alternative method uses the 30-day deworming program between 40 and 75 lb., followed by the single treatments at the heavier weights.

Table 1. Summary of the most prevalent internal parasites of swine, age group affected, effects on host and effective antheimintics.

Parasites	Pigs in which major reproducing population is found	Specific ways in which parasites damage their hosts*	Effective antheimintics†
Threadworm (Strongyloides)	10-20 days Suckling pigs Breeding stock	Causes moderate to severe to bloody diarrheas in very young pigs. Can result in mortalities.	Tramisol®
Large roundworm *(Ascaris suum)*	Weanlings, Feeder pigs, 40-75 lb, 110 lb, Gilts, Sows, Boars	Its migrating larvae damage liver and lungs and create conditions favorable for development of bacterial and viral pneumonias, cause diarrheas, occlude intestine. Generally *Ascaris suum* causes liver condemnations. Economic damage occurs in pigs.	Atgard®, Banminth®, Hygromix®, Piperazine®, Thibenzole®, Tramisol®
Whipworm *(Trichuris suis)*	15-20 lb 40-85 lb	Accumulations of whipworms ulcerate the caecum and anterior large intestine. They provoke bloody diarrheas.	Atgard®, Hygromix®
Nodular worm (Oesophagostomum spp.)	All ages, 60-350 lb (increases with age)	The host response results in nodule formation, which decreases digestive efficiency, and outright illness often results.	Atgard®, Banminth®, Hygromix®, Piperazine®, Tramisol®
Stomach worm *(Hyostrongylus rubidus)*	All ages, 60-350 lb	Irritates the lining of the stomach or tunnel beneath it and causes inflammation and ulceration. The end result can be diarrhea.	Atgard®
Lungworm (Metastrongylus spp.)	Generally feeder pigs & older 60-150 lb pigs on old lots	Irritates the fine air passages, ruptures tissues, causes bleeding, allows development of pneumonias.	Tramisol®
Kidney worm (Stephanurus spp.)	Generally older pigs & breeding stock	Damages liver, perirenal tissues, ureters, kidney.	No treatment cleared

* In terms of economics, parasites affect their hosts by interfering with digestion, feed conversion, and weight gains so that production is made more expensive.

† These systems of treatment were designed to fit into feeding programs. The fact that a certain dewormer is listed does not necessarily mean that another will not do the same job. As a rule, the authors prefer broad-spectrum dewormers because the average parasitism has more than one kind of worm. Producers should be aware that excellent swine dewormers are now on the market (and more are on the way). Read and follow the directions on the labels very carefully.

Issued March 1981

☆U.S. Government Printing Office: 1991—340-939/109